

REMARKS

Claims 1–27 remain pending.

Claim Amendments

Each of the independent claims has been amended to change “slightly” to --only slightly--. This amendment is intended to clarify that the term “only slightly exceeds” defines both a lower limit and an upper limit to the 2-way communication range. The lower limit is that the 2-way range must exceed “the closest distance between...the interrogator and...the tagged object.” The upper limit is that the 2-way range cannot exceed this amount more than “slightly”.

Non-Statutory Double Patenting Rejection

Since all the claims currently stand rejected on other grounds, Applicant wishes to defer filing a terminal disclaimer until some claims are otherwise allowed. If some claims are amended in the course of subsequent prosecution, the amended claims may differ from the claims of the issued patent sufficiently so as to no longer be subject to a non-statutory double patenting rejection, and hence a terminal disclaimer may not be required for those claims.

Rejection under 35 USC 103

Each of claims 1–27 is directed to a method or apparatus for adjusting the 2-way communication range of an RFID system or apparatus to assist a human operator to individually handle and interrogate one or more tagged objects that each include an RFID tag transceiver. An RFID interrogator transceiver is mounted on the human operator. The 2-way communication range between the interrogator transceiver and the tag transceiver is adjusted to only slightly exceed the closest distance between the interrogator and the tag that is achieved while the operator is handling the tagged object. Advantageously, the invention minimizes or eliminates the likelihood that RFID tags on objects other than the one that an operator presently is handling will respond to the interrogator transceiver.

In interpreting the claims, it is important that the terminology “2-way communication range” is not used in a general sense, but has the specific meaning defined in Applicant’s specification (page 7, lines 5–13): the *lesser* of (a) the 1-way communication range from the tag to the interrogator, and (b) the 1-way communication range from the interrogator to the tag. As explained in the specification at page 7, lines 14–24, these two 1-way ranges (a) and (b) generally are not equal. Range (a) is determined by the tag’s transmitted power and the interrogator’s receiver sensitivity, and range (b) is determined by the interrogator’s transmitted power and the tag’s receiver sensitivity.

The claims require that whichever one of these two 1-way ranges is shorter is the one that must

be set to *slightly* exceed the specified distance. The other one of these two 1-way ranges can be any greater value.

All of the claims were rejected under 35 USC 103 as unpatentable over Verster, Landt, and Boyles.

Verster

Verster discloses a portable direction-finding transceiver 12 used to locate an object such as suitcase 20 having an RFID tag transponder 18. The Examiner admits that Verster lacks any disclosure of adjusting the 2-way communication range. In fact, Verster lacks any disclosure of adjusting any sort of communication range, either 1-way or 2-way.

Landt

Since Verster lacks any disclosure related to adjusting communication range, the Examiner relies upon Landt as teaching “a sensitivity control signal and reception sensitivity for the purpose of improving the error rate of the transmitting signal...”. The Examiner contends it would be obvious “to have utilized the reception sensitivity of Landt in the tag system of Verster since such would improve the quality of the signal received thereby effecting the reliability range of the tag.”

The Examiner’s characterization of Landt is somewhat over-simplified. The purpose of Landt’s tag having an adjustable receiver sensitivity is to conserve the tag’s battery power when no interrogator is communicating with the tag. The receiver sensitivity switches between (1) a low sensitivity that conserves battery power when no interrogator signal is present and (2) a high sensitivity that ensures reliable reception when the tag is communicating with an interrogator. Landt’s low and high sensitivity values are not adjustable; they are permanently fixed by resistors 33 and 39 (col. 6, lines 17–20).

Landt fails to suggest at least two features of Applicant’s invention: (1) adjusting a 2-way range instead of a 1-way range; and (2) limiting the range to “only slightly exceed the closest distance between...the interrogator and...the tagged object.”

Firstly, Landt lacks any disclosure of adjusting the 2-way communication range. Landt’s two receiver sensitivities affect only the 1-way communication range from the interrogator to the tag. Landt completely lacks any mention of communication range, much less any disclosure of whether the 1-way range from the interrogator to the tag is greater than or less than the 1-way communication range in the opposite direction, i.e., from the tag to the interrogator. If the 1-way range from Landt’s interrogator to the tag is greater than the 1-way range from Landt’s tag to the interrogator, the 2-way range as defined by Applicant will remain constant, i.e., the 2-way range will remain equal to the shorter 1-way range from the tag to the interrogator that is not adjusted. Therefore, Landt fails to

disclose adjusting the 2-way communication range as that term is defined in Applicant's specification. Therefore, Landt lacks *any* disclosure of adjusting such 2-way communication range, much less adjusting it to the specific value specified in the claimed invention.

In the 3/12/99 office action in the parent of the present application (page 7, paragraph 12.a.), the Examiner responded to the preceding argument by contending that "2-way communication includes 1-way communication." This contention overlooks Applicant's specific definition of 2-way communication range. As explained above, Landt's disclosure of adjusting 1-way communication range from the interrogator to the tag fails to suggest adjusting the 2-way communication range as defined by Applicant.

Secondly, Landt lacks any disclosure of communication range, much less any disclosure of such range being within the limits of the claimed invention. Although Landt's two receiver sensitivities inherently result in two different 1-way communication ranges (1-way from the interrogator to the tag), Landt does not disclose or suggest imposing any upper limit on the communication range. Therefore, Landt lacks any disclosure of adjusting such range to "only slightly exceed the closest distance between...the interrogator and...the tagged object."

In the 12/8/99 office action in the parent of the present application (page 7), the Examiner responded to the preceding argument by contending that "the differences and advantages between slight increases and large increases is well known and within the level of skill in the art." However, the claimed invention does not differ from Landt merely in the magnitude of an increase. The claimed invention requires an upper limit to the 2-way range, whereas Landt does not disclose or suggest imposing any upper limit whatsoever.

Boyles

The Examiner does not contend that either Verster or Landt suggests limiting the 2-way communication range between the interrogator and the tag, as required by the claimed invention. Therefore, the Examiner relies on Boyles as teaching "limiting the range of the transponder such that the distance between the user and the device during operation is slightly greater than the operational range of the transponder to prevent the operation of other transponders, since they will be out of range."

The undersigned respectfully points out that Boyles does not disclose any transponders or transceivers. A transponder or transceiver is a device that both receives communication signals and transmits signals in response to the received signals. A transmitter alone (without a receiver) or a receiver alone (without a transmitter) is not a transceiver. The system disclosed by Boyles is a remote control for unlocking automobiles. Boyles' remote control device held by the user is only a transmitter; it is not disclosed as having any receiving capability. The device within each automobile is



only a receiver; it is not disclosed as having any transmitting capability. Therefore, Boyles lacks any disclosure of a system that includes either an interrogator transceiver or an RFID tag transceiver as required by the claimed invention.

Furthermore, the system disclosed by Boyles does not include permit any 2-way communication; it only permits 1-way communication from the handheld remote control transmitter to the receivers within the automobiles. Therefore, Boyles lacks any disclosure of adjusting or limiting a 2-way communication range as required by the claimed invention.

Although Boyles does disclose limiting the range of this 1-way communication, this cannot be considered to suggest the claimed invention which limits the 2-way communication range. As explained in the preceding discussion of the Landt reference, limiting the 2-way communication range as defined by Applicant is not obvious based on a prior art disclosure of limiting a 1-way communication range, because adjusting the 1-way range in one direction may not affect the 2-way range at all. For example, if the 1-way communication range from the interrogator to the tag is greater than the 1-way range from the tag to the interrogator, then the 2-way range will be limited entirely by the latter 1-way range (tag to interrogator), so that adjusting the former 1-way range (interrogator to tag) will have no effect on the 2-way range.

Conclusion

In summary, Verster lacks any disclosure of adjusting either 1-way or 2-way communication range. Landt lacks any explicit disclosure of communication range. Landt discloses the tag's receiver sensitivity having low and high values when it is inactive and active, respectively, but at most this would affect only a 1-way communication range from the interrogator to the tag, which may have no effect whatsoever on the 2-way communication range defined by Applicant. Boyles does not disclose any transceivers at all, and hence cannot disclose or suggest 2-way communication of any kind, much less adjusting a 2-way communication range.

Therefore, none of the references includes any disclosure or suggestion of adjusting the 2-way communication range, much less any disclosure or suggestion of establishing such 2-way range within the specific limits of the claimed invention. Accordingly, claims 1-27 are patentable.

Respectfully submitted,

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Amended Claims — Marked Up to Show Changes

1 1. (amended) A method of adjusting the two-way communication range of an RFID system to permit a
2 person to individually handle and interrogate each one of a plurality of tagged objects, each tagged
3 object having an RFID tag transceiver, comprising the steps of:

4 mounting on the person an RFID interrogator transceiver having an antenna;

5 mounting on each tagged object an RFID tag transceiver, wherein

6 each tag transceiver is characterized by a set of one or more performance parameters
7 which control a reliable two-way communications range between that tag transceiver and the
8 interrogator transceiver, and

9 the interrogator transceiver is characterized by a set of one or more performance
10 parameters which control the reliable two-way communications range between the interrogator
11 transceiver and any of the tag transceivers; and

12 adjusting at least one of the performance parameters so that the reliable two-way
13 communications range between the interrogator transceiver and the tag transceiver of each of the tagged
14 objects only slightly exceeds the closest distance, during times when the person handles that tagged
15 object, between the antenna of the interrogator and the tag transceiver mounted on that tagged object.

1 8. (amended) A method of adjusting the two-way communication range of an RFID system to permit a
2 person to individually handle and interrogate each one of a plurality of tagged objects, each tagged
3 object having an RFID tag transceiver, comprising the steps of:

4 mounting adjacent the person an RFID interrogator transceiver having an antenna;

5 mounting on each tagged object an RFID tag transceiver, wherein

6 each tag transceiver is characterized by a set of one or more performance parameters
7 which control a reliable two-way communications range between that tag transceiver and the
8 interrogator transceiver, and

9 the interrogator transceiver is characterized by a set of one or more performance
10 parameters which control the reliable two-way communications range between the interrogator
11 transceiver and any of the tag transceivers; and

12 adjusting at least one of the performance parameters so that the reliable two-way
13 communications range between the interrogator transceiver and the tag transceiver of each of the tagged
14 objects only slightly exceeds the closest distance, during times when the person handles that
15 tagged object, between the antenna of the interrogator and that tagged object.

1 10. (amended) An RFID interrogator apparatus having an adjustable two-way communication range
2 so as to permit a person to individually interrogate the closest one of a plurality of nearby tagged
3 objects, wherein each tagged object has a respective RFID tag transceiver attached thereto, comprising:
4 an RFID interrogator transceiver characterized by a set of one or more performance parameters
5 which control a reliable two-way communications range between the interrogator transceiver and any
6 of the RFID tag transceivers;
7 an antenna which is connected to the interrogator transceiver and which is adapted for
8 mounting on a person; and
9 a control logic circuit, connected to the interrogator transceiver, for adjusting at least one of the
10 performance parameters so that the reliable two-way communications range between the interrogator
11 transceiver and the tag transceivers only slightly exceeds the closest distance, during times when said
12 person handles a tagged object, between the antenna and the tag transceiver attached to that tagged
13 object.

1 15. (amended) An RFID tag having an adjustable two-way communication range so as to permit a
2 person operating an RFID interrogator transceiver to individually interrogate the tag without
3 interrogating other RFID tags which are more distant from the interrogator transceiver, comprising:
4 an RFID tag transceiver adapted for attachment to a tagged object, wherein the tag transceiver is
5 characterized by a set of one or more performance parameters which control a reliable two-way
6 communications range between the tag transceiver and any RFID interrogator transceiver; and
7 a control logic circuit, connected to the tag transceiver, for adjusting at least one of the
8 performance parameters so that the reliable two-way communications range between the tag transceiver
9 and any interrogator transceiver only slightly exceeds the closest distance, during times when said
10 person handles a tagged object to which the tag transceiver is attached, between said interrogator
11 transceiver and the tag transceiver.

1 19. (amended) An RFID system having an adjustable two-way communication range so as to permit a
2 person to individually interrogate the closest one of a plurality of nearby tagged objects, comprising:
3 a plurality of tagged objects, wherein each tagged object includes a respective RFID tag
4 transceiver attached thereto;
5 an RFID interrogator transceiver characterized by a set of one or more performance parameters
6 which control a reliable two-way communications range between the interrogator transceiver and any
7 of the RFID tag transceivers;
8 an antenna which is connected to the interrogator transceiver and which is adapted for
9 mounting on a person; and

10 a control logic circuit, connected to the interrogator transceiver, for adjusting at least one of the
11 performance parameters so that the reliable two-way communications range between the interrogator
12 transceiver and the tag transceivers only slightly exceeds the closest distance, during times when said
13 person handles a tagged object, between the antenna and the tag transceiver attached to that tagged
14 object.

1 24. (amended) An RFID system having an adjustable two-way communication range so as to permit a
2 person to individually interrogate the closest one of a plurality of nearby tagged objects, comprising:
3 an RFID interrogator transceiver having an antenna adapted for mounting on a person; and
4 a plurality of RFID tags, each tag being adapted for attachment to a tagged object, wherein each
5 tag includes
6 an RFID tag transceiver which is characterized by a set of one or more performance
7 parameters which control a reliable two-way communications range between the tag transceiver and the
8 RFID interrogator transceiver, and
9 a control logic circuit, connected to the tag transceiver, for adjusting at least one of the
10 performance parameters so that the reliable two-way communications range between the tag transceiver
11 and the interrogator transceiver only slightly exceeds the closest distance, during times when said
12 person handles a tagged object to which said RFID tag is attached, between said interrogator
13 transceiver and the tag transceiver of said RFID tag.